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CENTRE OF EXCELLENCE
IN AIR TRAFFIC MANAGEMENT (ATM) TRAINING

ASTRACT

In order to understand the scope of the quality programme the EUROCONTROL Institute of Air Navigation Services (IANS) is introduced and the reasons for the need of an excellence programme highlighted. Its high level objectives and long-term role assigned to it by the member states of Eurocontrol are explained and the scene is set to allow embarkation on the road to excellence.

Under the heading of "Elements of Excellent Organisations" the difference is made between ISO (International Standards Organisation) and the European Foundation of Quality Management (EFQM) with its more holistic approach to TQM (Total Quality Management). Some quality concepts and definitions as well as the notion of "continuous improvement" are introduced. As the Institute chose the EFQM Model of Business Excellence as the road map to excellence this model using an enabler part and a results part is presented.

The Institute's strategy for excellence is explained in the next chapter giving some details on the technique of self-assessment, a key element in the process of continuous improvement. Outcome and benefits for IANS of the three full and the one partial self-assessments are considered taking into account the cycle of continuous improvement, i.e. self-assessment, followed by the establishment of an improvement plan, followed by the implementation of improvement projects.

existence and the redefinition of its role

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INTRODUCTION

The EUROCONTROL Institute of Air Navigation Services (IANS)

IANS is a directorate within EUROCONTROL, the European Organisation for the Safety of Air Navigation. The Institute provides ATM training primarily for the member states of EUROCONTROL and also for non-member states belonging to the European Civil Aviation Conference (ECAC). IANS was founded in 1969 when EUROCONTROL consisted of 6 member states. At the time of writing, membership stands at 28 and another 9 ECAC states, which are not members of EUROCONTROL, are served as well. The Institute is located in the Grand Duchy of Luxembourg in the very core area of Europe. Each year the Institute trains 40 to 50 ab-initio air traffic controllers and provides continuation training including workshops for nearly 2500 ANS personnel.

Historical Data

In the early nineties the Institute was in need of larger accommodation and applied for funds to construct a new building. However, the governing body of EUROCONTROL, at that time called Committee of Management, requested the establishment of a business case providing justification for the Institute's before approval was to be given. As a

result of this a group of senior officials from key member states of EUROCONTROL were tasked to assign high level objectives and a long term role to IANS. These comprised the following main elements:

- Adopt the principle of subsidiarity and partnership, meaning that no training activity should be undertaken by the EUROCONTROL Agency which could be better performed by member states, except where such training is specifically requested by member states or where harmonisation principles require it.
- Ensure harmonisation of training in Europe, i.e. the ECAC states, through the development of common core training syllabi.
- Enhance innovation by establishing new and more advanced training concepts.
- Raise performance by providing a higher quality output and foster a culture of continuous improvement.
- Develop staff satisfaction by fostering a culture of trust, honesty, integrity and respect for the individual.
- Gain influence by providing reliable and relevant training information, courses and programmes.
- Promote efficiency and effectiveness by managing and controlling costs and achieving the objectives in a cost effective way.

This statement of values culminated in the vision that IANS was to become a centre of excellence in the field of ATM training in Europe.

It was quite evident that most of the factors considered essential for the continued existence of the Institute had to do with quality in the widest sense and that organisational excellence would be the key to its future success. The need for a process ownership for quality and that for customer relations was identified and two senior managers were appointed to fill the posts. They have, in the meantime, become the focal point for business planning and organisational development.

With this done, the scene was set to embark on the long and winding road to excellence.

ELEMENTS OF EXCELLENT ORGANISATIONS

Quality Concepts and Definitions
Most of the Institute management and staff had not been in very close contact with the concept of quality in general or quality management in particular. The majority having an ATS operational or technical background would regard safety as the key element in our profession with quality merely a by-product of it. The reflection would not go beyond the statement "if it is safe, it must be good".

At the start of the process only three things were clear:
- There is no single answer to what we mean and understand by the term quality.
- The goal was to become a centre of excellence using a well structured and measurable method.
- The Institute did not have sufficient expertise in-house to reach this goal and would have to depend on external support to start-off the process.

When looking for an appropriate approach, we were confronted with two main trains of thought associated with quality, i.e.:
- TQM Total Quality Management
and
- ISO International Standards Organisation

We understood that if we wanted to put emphasis on quality control, quality assurance and quality management, the ISO route, i.e. conformance to requirements, was the way to go. The underlying theme of ISO being "say what you do, do what you say and prove it", the system produces standards and norms which give assurance to customers that design and production are done in a consistent and standardised way. The outcome resulting from design and production is a consistent product, but not necessarily a product of the highest quality.

If quality was to be an indication of organisational excellence, totally satisfying stated needs, looking at outstanding practice in managing the organisation and achieving results, TQM was to be our future. TQM provides a total management approach for meeting customer needs and expectations and involves all managers and employees in using quantitative methods to improve continuously the organisation, products and services. TQM is based on behaviours and concepts such as:

- Results orientation
- Customer focus
- Leadership and constancy of purpose
- Management by processes and facts
- People development and involvement
- Partnership development
- Public responsibility
- Continuous learning, improvement and innovation.

Other key principles are:

- Customer loyalty
- Balancing and satisfying the interests of all stakeholders
- Long-term success.

Coincidental with this process of reflection at the Institute, a EUROCONTROL Agency Quality Policy signed by our Director General was issued. It reads as follows:

- Our Policy is to aim for excellence both in the way we conduct the Agency's business and in the results we deliver with respect to the Agency mission.
- To achieve this aim, we recognise the key role of leadership and the active involvement of all our people.
- We are striving to provide customer satisfaction and visibility of performance in all our activities.
- To achieve excellence, we are seeking continuous improvement of our products and services. We will measure our progress towards excellence by means of regular self-assessment.
- The implementation of the Agency Quality Policy and the provision of means and resources are the responsibility of each Directorate.

Choice of a Quality System

Having the vision of "becoming a centre of excellence in the field of ATM training in Europe" firmly entrenched in our minds, we concentrated on the key issue "excellence". Our broad objectives were:

- Quality is to become a management philosophy.
- Promote a holistic approach to managing our organisation according to best practices of leading companies world-wide.
- Bring about a total change in management culture from top to bottom.
- In pursuing excellence, become a learning organisation.

One organisation in Europe having written "EXCELLENCE" in large letters on its banner and meeting most of our quality requirements is the European Foundation of Quality Management (EFQM) promoting quality through an Excellence Model. This model follows closely the one used for the Malcolm Baldrige National Quality Award, a system better known in the US.

Before making a final choice, we positioned ISO in respect to our own understanding of excellence and came to the following conclusion as shown in **Table** **1**:
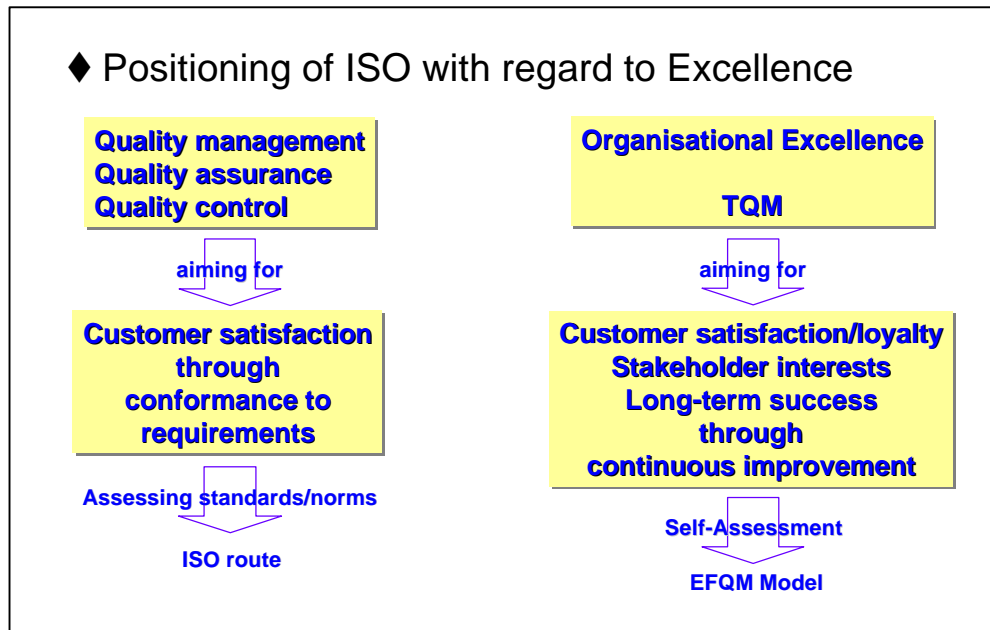
Table 1

The assessment also showed that measured against the EFQM Excellence Model ISO would cover less than 50% of our excellence requirements when taking an average over the 9 domains of the model.

Table 2 depicts how much "excellence" in the various criteria of the EFQM model would be covered by the ISO quality system.
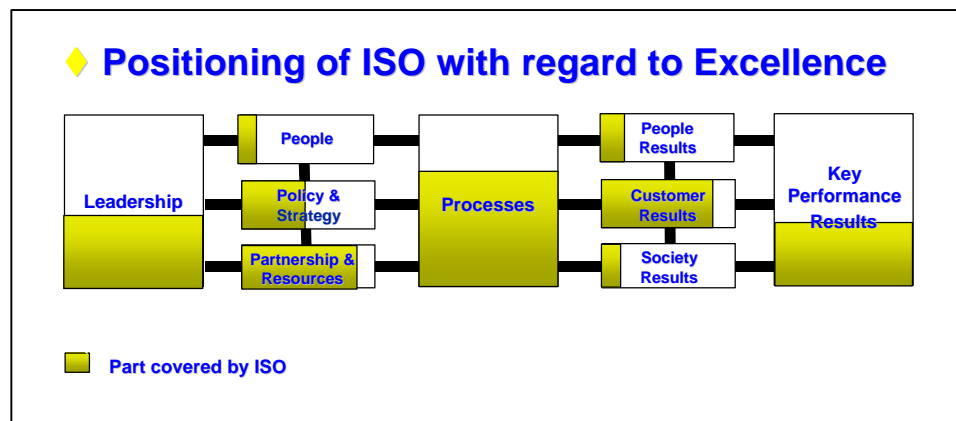

Table 2

In essence we wanted to become an excellent organisation and not just produce an excellent product. That is why we choose to pursue the way of the EFQM Excellence Model.

THE EFQM EXCELLENCE MODEL

Excellence in the context of this model is defined as outstanding practice in managing the organisation and achieving results based on the following concepts of TQM:

- Leadership and constancy of purpose
- People involvement and development
- Continuous learning, improvement and innovation
- Partnership development
- Public responsibility
- Management by processes and facts
- Customer focus
- Results orientation.

This translates into a practical application in the form of a model usable in a structured management system, shown in **Table 3**.

Leadership
How leaders are managing the organisation and are role models of a culture of excellence.

Sub-criteria addressed are:
- Mission, vision and values
- The organisation's management system
- Customer and partner relationship
- The organisation's people
- Role model of a culture of excellence.

- Policy and Strategy
How the organisation implements its mission and vision via a clear stakeholder focused strategy, supported by relevant policies, plans, objectives, targets and processes.

Sub-criteria addressed are how policy and strategy are:
- based on internal and external input
- developed, reviewed and updated
- deployed through a framework of key processes
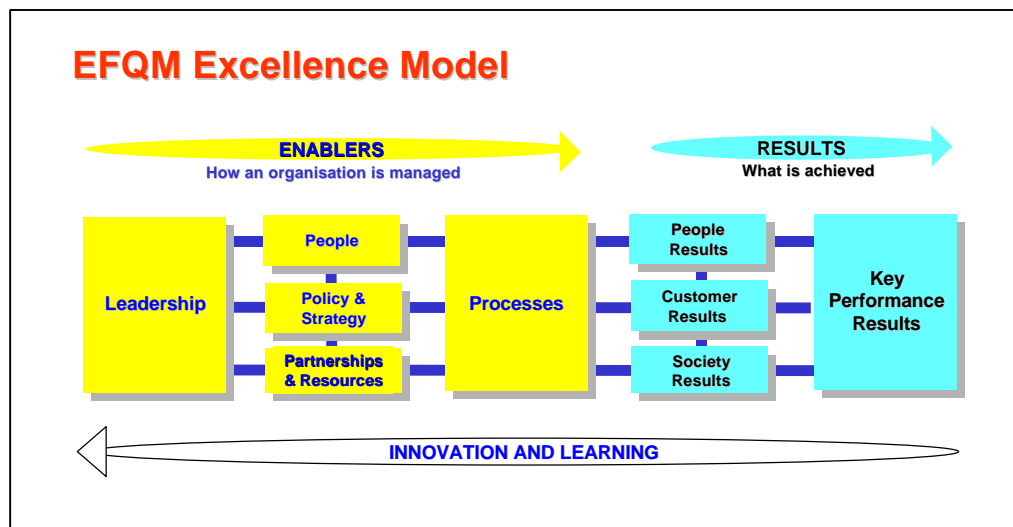- communicated and implemented.

Table 3

Enabler Elements of the EFQM Model
In respect of the 5 enabler elements, the organisation is assessed taking into account the following criteria:

People
How the organisation manages, develops and releases the knowledge and full potential of its people in order to support its policy

and strategy and the effective operation of its processes.
Sub criteria addressed are how:
- people resources are planned, managed and improved
- people knowledge and competencies are identified, developed and sustained
- people are involved in improvement activities and empowered to take action
- people and the organisation have a dialogue
- people are rewarded, recognised and cared for.

- Partnerships and Resources
  How the organisation plans and manages its external partnerships and internal resources in order to support its policy and strategy and the effective operation.

  Sub criteria addressed are how the following elements are managed:
  - External partnerships
  - Finances
  - Building, equipment and material
  - Technology
  - Information and knowledge.

- Processes
  How the organisation designs, manages and improves its processes in order to support its policy and strategy, and satisfies ultimately its customers and other stakeholders.

  Sub criteria addressed are:
  - The design and management of processes
  - The continuous improvement of processes
  - The design and development of products and services
  - How products and services are produced, delivered and serviced
  - How customer relationships are managed and enhanced.

Results elements of the EFQM Model
The 4 results elements are measured against targets normally set on a regular basis during the business planning cycle. Serving as performance indicators they

are an essential management and reporting tool and provide the drive for continuous improvement.

The following criteria are taken into account:

- Customer Results
  What the organisation is achieving in relation to the satisfaction of its external customers.

  Sub criteria addressed are:
  - Identification of external customers
  - Identification of their criteria of satisfaction.

- People Results
  What the organisation is achieving in relation to the satisfaction of its people

  Sub criteria addressed are:
  - The people's perception of the organisation relating to motivation and satisfaction
  - Measurements used by the organisation to understand, predict and improve the satisfaction and involvement.

- Society Results
  What the organisation is achieving in relation to local, national and international society as appropriate.

  Sub criteria addressed are:
  - Society's perception of the organisation
  - Measurements used by the organisation to understand, predict and improve the satisfaction of society.

Key Performance Results
They relate to whatever the organisation has determined are the essential, measurable achievements required for the continued success of its business. Key performance results are measures of the effectiveness and efficiency in delivering products and services.

CONTINUOUS IMPROVEMENT - THE STRATEGY FOR EXCELLENCE

The objective being to become an excellent organisation, the Institute had to improve its performance. To become excellent overnight was not possible. Likewise it was realised that excellence is a moving target as IANS customers may from time to time expect other and/or better products and services. Thus the strategy of "continuous improvement" was adopted.

An essential part of this strategy is the annual self-assessment of the Institute against the European model of business excellence. Assessment in this context is defined as "a cyclic, comprehensive and systematic review of the organisation's activities and results against a model of organisational excellence culminating in planned improvement actions".

The model sets out detailed guidelines for best practice in running the organisation and provides a means of scoring in terms of overall excellence. An outline of maximum scoring in the various activities and results areas are shown in **Table 4.**

The self-assessment process starts by developing commitment, especially with senior management and by educating senior management in the use of the self-assessment tool. This is followed by planning the self-assessment and by establishing and educating a data collection and assessor team. Then comes the data collection where evidence of how things are done is gathered and a score is proposed. Finally, a consensus workshop takes place where the assessor team presents evidence related to allocated criteria, searches for consensus scoring on each criteria and the organisation's strengths and areas for improvement.

This process is repeated at regular intervals, e.g. once a year, and thus the organisation will drive itself towards excellence by continuously repeating the cycle depicted in **Table 5.**

The Institute has so far conducted 3 full-scale self-assessments and one "desk-top" assessment where 4 senior managers and a consultant sat around a table and produced some "gut feeling" scores. This was done in order to determine whether

Self-Assessment Score Card

People
90 points

Policy & Strategy
80 points

Leadership
100 points

Partnerships
& Resources
90 points

Processes
140 points

People Results
90 points

Customer Results
200 points

Society Results
60 points

Key
Performance
Results
150 points

ENABLERS
How an organisation is managed
max. 500 points
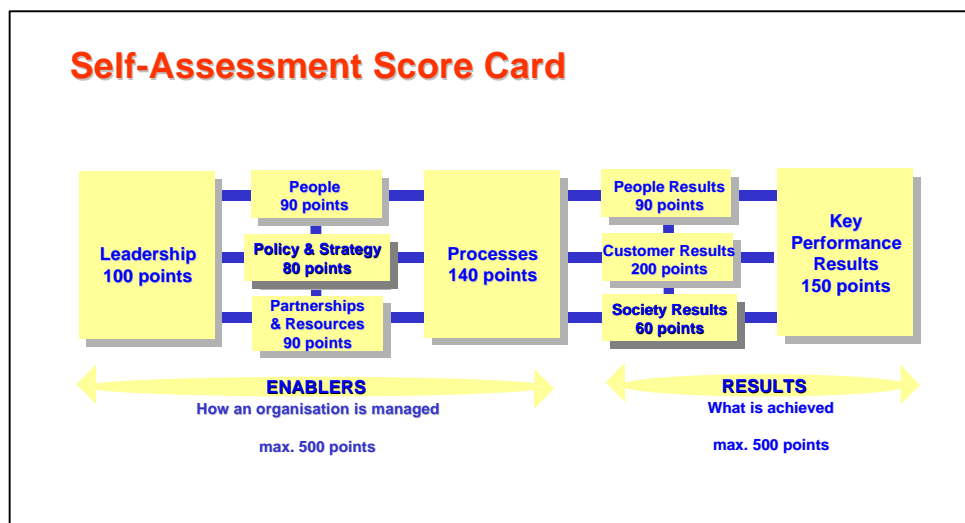
RESULTS
What is achieved
max. 500 points

Table 4

Though an overall maximum of 1,000 points may be reached, scores above 700 are considered "best in class", 450 to 500 a good average and 150 to 200 a typical beginner's score.

we were "on track" with our quality program.

Outcome and Benefits

At the beginning of the process the EFQM providing lists of strengths and areas for improvement. We are now moving more and more into using it as a business planning and strategy tool as shown in **Table 6**.

Another clearly defined outcome was the assessment score though we realised that the by-product of the scoring, i.e. the identification of opportunities for continuous improvement, is more important than the score itself. Self-assessment also provided us with an annual improvement plan and a set of improvement targets, regularly reviewed and adjusted.

The following is a list of main benefits the Institute derived from the self-assessment process:

- a structured approach to organisational improvement based on facts and not on individual perceptions
- prioritisation and planning of annual improvement activities
- a means of measuring progress over time through periodic self-assessment
- a means to benchmark internally as well as against other organisations

model gave us a "health check" by

- a means to integrate various quality initiatives into normal business operations (applicable to all levels of an organisation ranging from individual units up to the organisation as a whole)
- a business planning tool
- a strong motivator for management and staff
- a change agent, fostering a learning culture.

The general impression gained on the self-assessment process indicated on the positive side that it was relatively simple and well structured, transparent to management and staff, well manageable and adaptable to a multicultural environment. It became the main driver for continuous improvement and provided a realistic assessment of progress. On the negative side one has to admit that it is labour intensive and from a manpower point of view quite costly.

Self-Assessment Techniques

◆ **How assessment drives improvement**

New procedures improved results → Self-Assess → Strengths / Areas for improvement / Scoring

Implement improvements ← Identify and plan improvement projects

Improvement programme → projects / Targeted scores

Table 5

Uses of the Model

Self-Assessment	**Business Plans & Self-Assessment**	Re-organisations Process Management Staff Planning Personal Development Model New Business Creation Resource Management Project Management Visioning
Health Check	**Planning Tool**	**Strategic Tool**
← Phase 1 →	← Phase 2 →	← Phase 3 →

INCREASING USES OF THE EFQM MODEL

Cost and Manpower Effort

The Institute quality initiative using the EFQM model was launched in the second half of 1996. The following **Tables 7** (Internal Effort) and **8** (External Effort) depict expenditure and effort over the past 3 years.

INTERNAL STAFF EFFORT	
TIME SCALE	**TIME EFFORT**
Year of launch (1996)	½ man-year
1st year (1997)	2½ man-years
2nd year (1998)	2 man-years
3rd year (1999)	2 man-years
Subsequent years	Integral part of staff/ Management activities (quality culture)

Table 7

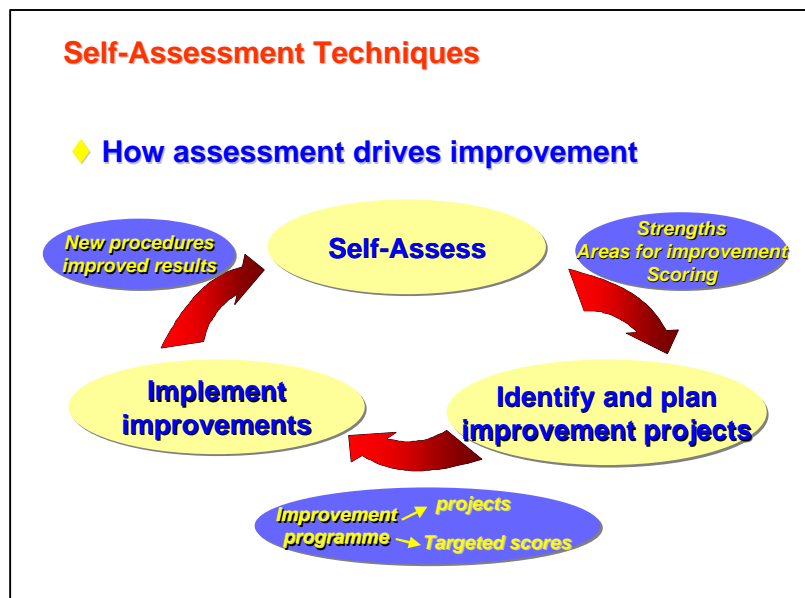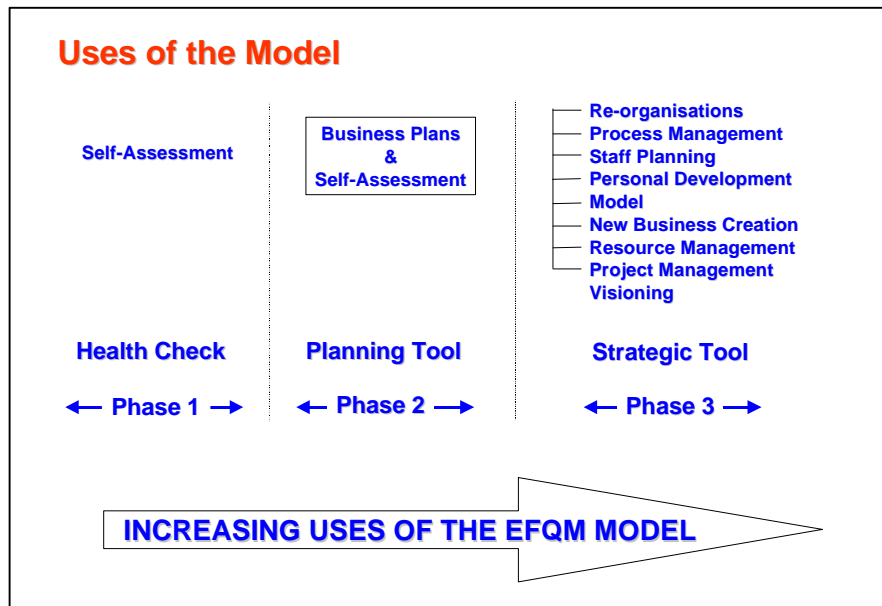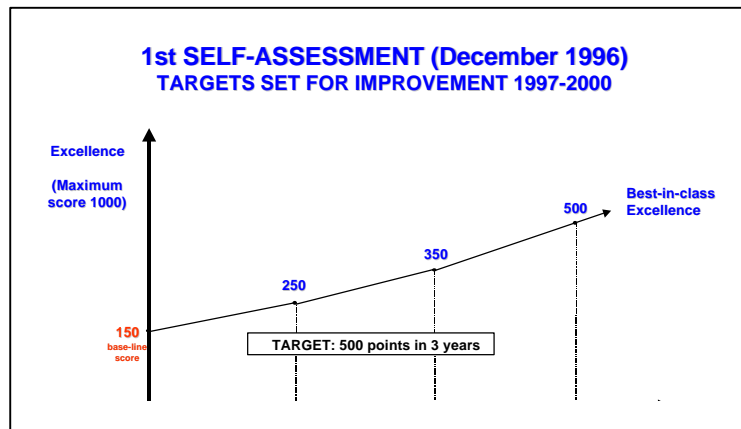| EXTERNAL STAFF EFFORT		
TIME SCALE	**CONSULTANT ASSISTANCE**	**CONSULTANT COSTS**
Year of launch (1996)	25 man-days	20.000 Euro
1st year (1997)	120 man-days	120.000 Euro
2nd year (1998)	70 man-days	70.000 Euro
3rd year (1999)	50 man-days (planned)	50.000 Euro
Subsequent years	to be determined	

Table 8

Table 6

THE JOURNEY TO EXCELLENCE

Road Map to Excellence

When we embarked on our journey to excellence 3 years ago we were warned by a knowledgeable consultant that sometimes the naked truth of the first self-assessment could be a painful experience. It was! Our base-line score was a mere 150 points and thus provided considerable scope for improvement! Based on that score we set our targets for improvement as shown in **Table 9.**

We then decided to establish a prioritisation cut-off datum at 25% of the maximum possible score. Every model criterion which had scored above that datum was allocated a low priority for improvement, those below the datum would be treated on a priority basis. This was the case for People Results (7%), Customer Results (7,5%), Policy and Strategy (11%), Business Results (12%) and Processes (14%). The prioritisation process following the first self-assessment is depicted in **Table 10**.

Self-assessments were repeated in December 1997 and July 1999. The Institute moved to new premises in December 98/January 99 and no spare capacity was available to conduct a full self-assessment towards the end of last

1st SELF-ASSESSMENT (December 1996)
TARGETS SET FOR IMPROVEMENT 1997-2000

Excellence

(Maximum score 1000)

Best-in-class Excellence

500

350

250

150 base-line score

TARGET: 500 points in 3 years

1st SELF-ASSESSMENT (December 1996)
PRIORITISATION OF IMPROVEMENT PROJECTS 1997

Model criterion	Max. score	1st Self-Assessment (Dec. 96) Points scored	in %	Prioritisation criterion in %	Priority projects 1997
Leadership	100	28	28	25	-
Policy and Strategy	80	9	11	25	x
People Management	90	30	33	25	-
Resources	90	29	32	25	-
Processes	140	19	14	25	x
Customer Results	200	15	7,5	25	x
People Results	90	6	7	25	x
Impact on Society	60	-	-	25	-
Key Performance Results	150	18	12	25	x
Total points	1.000	154	-	-	-

3rd SELF-ASSESSMENT (July 1999)
TARGETS FOR IMPROVEMENT

Excellence

(Max. score 1000)

Best-in-class Excellence

600 (target)

500 (target)

390 (measured)

400 (target)

350 (measured)

350 (target)

290 (measured)

250 (target)

150 (base-line score)

2nd SA   Desk-top SA   3rd SA

Dec 1996   Dec 1997   Dec 1998   July 1999   July 00   July 01
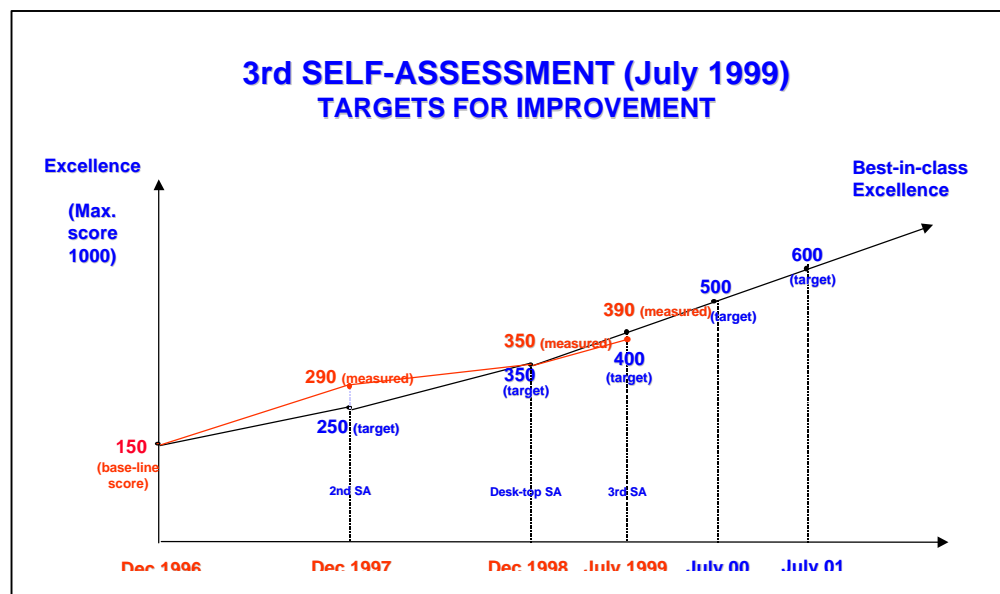
year. Hence the "desk-top" assessment mentioned earlier took its place, just to see whether we were "on track". The regular self-assessment was postponed to June/July 99 and this will henceforth be the scheduled months for future self-assessments.

Results are encouraging. Steady progress is being made and measured scores were not far from targets set, i.e. December 97 - 290 points against 250 targeted, December 98 -350 against 350 and July 99 - 390 against 400 as shown in **Table 11**.

Table 12 shows the percentage score of the 3rd self-assessment which will be used again to determine priorities for the next improvement plan. All model criteria which scored below 40% will be treated on a priority basis. This table also shows a graph of an EFQM "best-practice" score as well as an EFQM average score ("average score" in this context means the average criterion score calculated from all the applications received by the EFQM for a quality award since 1992).

The graph representing the Institute's performance shows a slow convergence towards an EFQM average value. The enabler side looks particularly promising and we are confident that as soon as the performance indicators now set in place will provide tangible figures the results side will also improve.

Improvement Projects
Since the start of the Institute's quality initiative 3 years ago a total of 15 quality projects were started, of which 12 are completed or near completion and 3 will be carried forward into the next year. 5 management and staff training and quality awareness actions were also launched in the same period. The following is a list of completed and on-going improvement initiatives:
- Identification of customer training needs
- Measurement of customer satisfaction
- Identification of core processes
- Establishment of performance indicators

- Development of a strategic business plan
- Staff training and development plan
- Improvement of internal communication*
- Staff climate survey
- Development of course delivery procedures
- External benchmarking*
- People management resulting from staff climate survey
- Design, procurement and installation of a multi-media classroom for Air Traffic Management (ATM) training
- Development of procedures to publish the IANS course programme on INTERNET
- Development of an IANS organisational and management handbook*

Apart from individual staff training and development the following collective training measures were taken for management and staff:

- Quality awareness for all staff including management
- "Leading Excellence" training for managers
- Specific training for process owners
- Management training: "Coaching and Performance Management" and still to come this year "Team Management"
- Training for internal assessors conducting self-assessments.

New improvement projects derived from the results of the July 99 self-assessment are not yet determined.

Many of the above listed improvement projects have already become part of the Institute's every-day activities and are updated during the course of the annual business cycle. For example:
- Customer training needs are researched once every 2 years, last time in winter 98/99.
- Customer satisfaction is measured continuously and a comprehensive report produced annually.

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* Projects marked with an asterisk (*) will be carried forward into the year 2000.

3rd SELF-ASSESSMENT (July 1999)
PRIORITISATION OF IMPROVEMENT PROJECTS 1999/2000

Criterion Scores (in percent)

EFQM "Best Practice" score: 74, 78, 75, 78, 74, 77, 72, 71, 80
EFQM average score: 47, 49, 49, 52, 48, 46, 40, 41, 49
IANS 3rd self-assessment score: 54, 43, 49, 49, 31, 41, 34, 25, 29

Total score: 390

Model Criteria: Leadership, Policy + Strategy, People, Partnership & Resources, Processes, Customer Results, People Results, Society Results, Key Performance Results

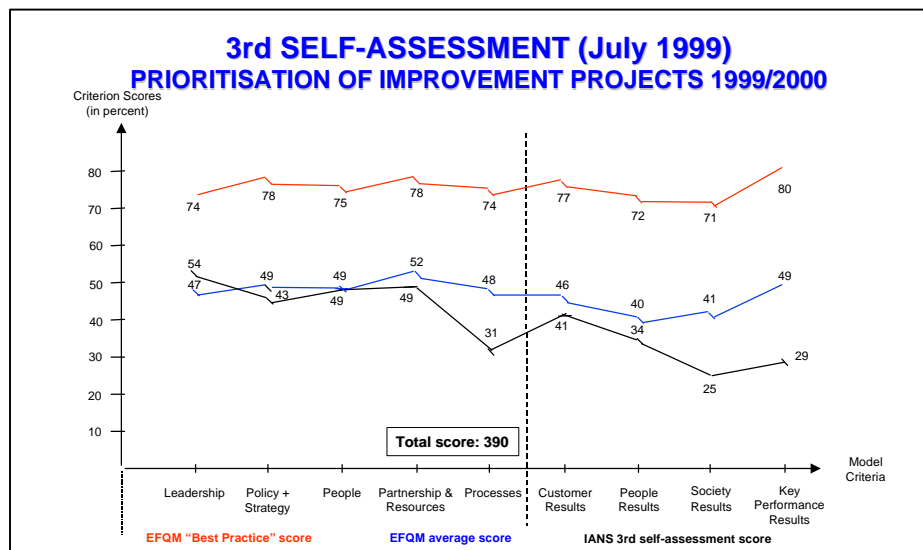EFQM "Best Practice" score   EFQM average score   IANS 3rd self-assessment score

Table 12

- The staff training and development plan is reviewed and updated as part of the annual staff appraisal process.
- A staff climate survey is conducted every 2 years, next during winter 99/2000.

CONCLUSION AND THE WAY AHEAD

We have learnt – most of the time the hard way – that

- Continuous improvement means change
- Change is painful and time-consuming
- Change means full and visible top-management commitment
- Change demands an open style of leadership
- Continuous improvement has to be a "way of life" and is not a "bolt-on" to Institute activities.

- The strategic business plan is reviewed and updated annually. The Institute remains nevertheless committed to the aim of being recognised as a Centre of Excellence in the field of ATM training. With the commencement of an excellence programme in 1996 and the subscription to the EFQM philosophy of "continuous improvement" we have made a number of important steps in this direction. We are now able to continuously and regularly establish where we stand and likewise review where we want to be and what needs to be done to reach to goal.

The aim is not only to do things right but also the do the right things.